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ABSTRACT

The first stage of development of a management information system for DIST/AVC (Division of Instructional Technology/Audio-Visual Center) is the definition of out-put units. Some constraints on the definition of output units are: 1) they should reflect goals of the organization, 2) they should reflect organizational structure and procedures, and 3) they should aid in making resource allocation decisions. (RH)

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DIST/AVC OUT-PUT DEFINITION

by

Gene L. Wilkinson

DIST/AVC OUT-PUT DEFINITION

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Man is an information dependent being.[1] Rational behavior, even sanity, depends on man's ability to predict on the basis of information received from his immediate surroundings. This basic need becomes even more essential for man in a social or organizational context, particularily for the manager of an organization who not only needs information for his personal actions but also needs information with which to make rational decisions which will affect all other individuals in the organization. Not only does the manager need information, he needs this information in a systematic, organized fashion, for there are limits on the amount of information a single individual can process and use effectively. Information overload can be as serious a problem as information deprivation. It is to provide the manager with sufficient information to make rational decisions yet not enough information to over-whelm his capacity to use information that management information systems are designed and implemented.

One type of information system which has been proposed for use in educational institutions is based on unit cost accounting.[2] At the heart of unit cost accounting is the unit which is to be measured and evaluated,

1 For an excellent discussion of man and information, see: Chapter 16, "Future Shock: The Psychological Dimension," in Alvin Toffler's Future Shock, Random House: New York, 1970, pages 305-326.

2 Two of the many sources on unit cost accounting in education are: Harris, S.E., "The Internal Efficiency of Higher Education," in Economic Aspects of Higher Education, Organization for Economic Co-operation and Development: Paris, 1962, pages 28-40, and Cain, J.H., "How Unit Cost Accounting Can Serve the College Field," College and University Business, 32, March 1962, pages 84-91.

and the most important decision to be made in establishing the management information system is to determine the out-put unit or units for the organization. If the organization has a single product and no other, such as an educational institution which is set up to train one type of student for one type of job, the task of defining the out-put unit is simple--the out-put is the number of the product produced. When the organization is more complex, such as a university, with multiple objectives and products, the task is more difficult. When the organization is a service unit contributing multiple products to all aspects of the larger organization while at the same time carrying on the same major functions as the larger organization, such as the Division of Instructional Systems Technology and Audio-Visual Center (DIST/AVC) within Indiana University, the task reaches an even higher level of difficulty. This paper is a report on the first stage of the development of a management information system for DIST/AVC, the definition of out-put units.[3]

The type and nature of out-put units identified for an organization are influenced by a number of constraints: (1) out-puts should reflect the goals of the organization, (2) out-puts should reflect the structure and procedures of the organization, and (3) out-puts should be defined in such a way that their measurement will aid the manager in arriving at sound decisions on the allocation of organizational resources.

3 For a discussion of some of the problems to be considered in such a project, see: Fogel, R.L., "Conditions for the Use of PPB," in Journal of Research and Development in Education, 3:4, Summer 1970, pages 72-79.

FIRST CONSTRAINT: OUT-PUT UNITS SHOULD REFLECT GOALS OF THE ORGANIZATION

The basic purposes of the Division of Instructional Systems Technology and Audio-Visual Center (DIST/AVC) of Indiana University, in spite of changes in name, shifts in emphasis, and the addition of services, have not changed substantially since they were set forth by Larson in 1958.[4] These basic purposes or goals are:

> "(1) to provide opportunities for advanced study, experience, and research in the practical and theoretical aspects of the production, selection, circulation, and utilization of the major types of audio-visual materials and in the organization and administration of an instructional materials program;
>
> (2) to contribute to instructional and research activities of all schools and departments at Indiana University by providing faculty members and students with professional assistance in the selection, procurement, and use of audio-visual materials and by offering assistance and facilities for the production of all types of materials;
>
> (3) to serve school and community groups to the extent that makes it possible to support a professional staff, to develop a general and specialized library of all types of materials, and to maintain specialized equipment and facilities for the production of audio-visual materials needed for discharging the three purposes."[4]

The general goals are reflected in this analysis by the grouping of DIST/AVC activities into three program catagories which cut across the structure and operational departments of DIST/AVC. These program areas, each of which represents one of the purpose statements, are: (1) Academic Program Activities, (2) Campus Service Activities, and (3) Revolving Fund Activities.

4 Larson, L.C., "An Integrated Approach to Film Production, Training, and Research," Journal of the University Film Producers Association, 10:3, Spring 1958, page 3.

SECOND CONSTRAINT: SHOULD REFLECT ORGANIZATIONAL STRUCTURE AND PROCEDURES

The organizational structure and operational procedures of DIST/AVC have been reflected in the out-put definition by two further sub-divisions--the first by operational departments of AVC and the second by functions or activities within departments.

DIST/AVC is an integrated program of professional education and service activities.[5] The Division of Instructional Systems Technology, which has responsibility for degree programs and other professional education activities, reports through the Director to the Dean of the School of Education. The Audio-Visual Center, which has responsibility for university-wide instructional support and development activities and off-campus revolving fund activities, reports through the Director to the Vice-President for Academic Affairs. The Division and the Center share staff on a joint appointment basis, facilities, and other resources. As a result, both elements of the integrated program are able to mount richer programs than either could mount on an independent basis.

DIST is organized into a number of committees and task forces which are responsible to the Director through the general faculty and the Assistant Director for Academic Affairs. Since DIST lacks a formal departmental structure, the initial breakdown of the Academic Program Area is in terms of definable activities rather than organizational units. AVC is organized into thirteen operational departments which are responsible to the Director

5 For a more detailed look at the philosophy and operation of an integrated program, see: Larson, L.C., "Developing an Integrated College Audio-Visual Program," Phi Delta Kappan, February 1957, pages 211-221.

through an Assistant Director for Operations. The breakdown of the DIST/AVC organizational elements within the three program areas is illustrated in FIGURE ONE. The location of each element was fixed during an analysis of

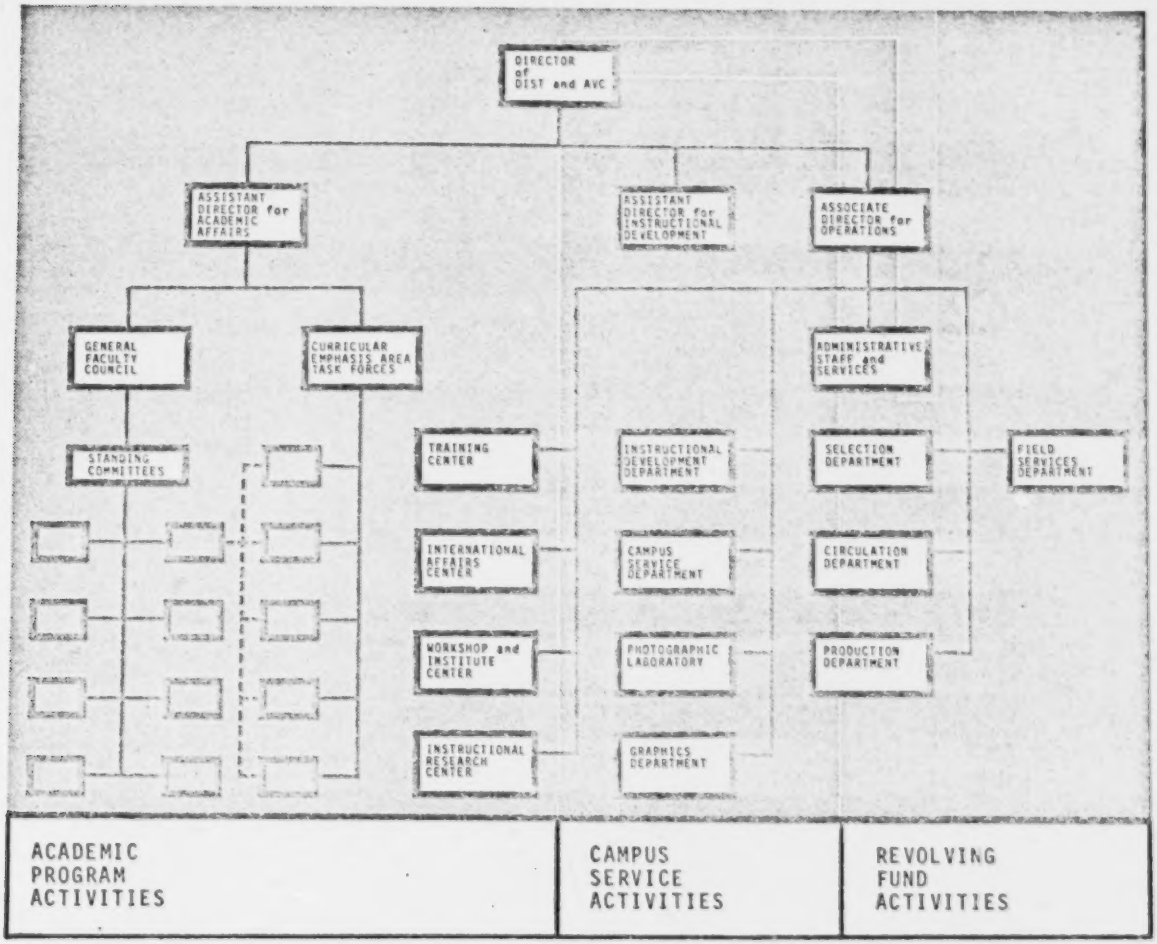

FIGURE ONE: Relationship of DIST/AVC Organizational Structure to the Three Basic Program Areas.

the activities carried out by the various departments. The locations are determined by the major functions of the organizational element. When a minor activity administered by a department contributes to the goals of a

program other than that of the home department, such as the Curriculum Resources Center within the Selection Department, the minor activity is split out in the out-put definition and listed under the program area appropriate to the minor activity rather than under the program area appropriate for the total department. The functions listed in the activity column in FIGURE TWO (pages 7-11) correspond to the operational departments of the Audio-Visual Center, with a few exceptions as noted below.

Four of the operational departments--Administration, Selection, Circulation, and Production--conduct activities which contribute directly to the goals of more than one program area. In these cases, it has been necessary to list the activity under each of the appropriate program areas, creating a complete program definition at the cost of complication in the measurement of departmental out-put.

Four other departments--Training, International Affairs, Workshops and Institutes, and Instructional Research--contribute directly to the various activities identified under the academic program and therefore disappear in the out-put analysis since their cost and productivity would be a sub-element of the larger activity. For example, the measure of the stockroom activity of Training would be a factor of the number of laboratory course enrollments not the number of mounting frames or marking pens issued.

Some departments are composed of a number of sub-units, such as Campus Service which administers five sub-centers and the Audio Studio as well as providing a central equipment pool and projectionist service. Such major activities are separated out on the first level of analysis, rather than being identified as a sub-activity of the home department.

FIGURE TWO: Breakdown of DIST/AVC Programs, Activities, and Out-puts.

PROGRAM	ACTIVITIES	SUB-ACTIVITIES	OUT-PUT INDICATORS
ACADEMIC PROGRAM ACTIVITIES	1.1 STUDENT SERVICES	1.1.1 RECRUITMENT	(a) inquiries received (b) applications submitted (c) students admitted
		1.1.2 COUNSELING & GUIDANCE	(a) instances (b) contact hours
		1.1.3 PLACEMENT	(a) inquiries received (b) recommendations sent (c) students placed
	1.2 CURRICULUM DEVELOPMENT	1.2.1 PROGRAM DEVELOPMENT	(a) program descriptions (b) course descriptions
		1.2.2 COURSE DEVELOPMENT	(a) student contact hours (B590) (b) outlines, bibliographies, etc. (c) package units
	1.3 DEGREE PROGRAMS	1.3.1 UNDERGRADUATE	(a) majors in progress (b) minors in progress (c) majors completed (d) minors completed
		1.3.2 3 YEAR - JR., SR., MASTER'S	(a) degrees in progress (b) degrees completed
		1.3.3 MASTER'S DEGREE	(a) degrees in progress (b) degrees completed
		1.3.4 SPECIALIST DEGREE	(a) degrees in progress (b) degrees completed
		1.3.5 DOCTORAL DEGREE	(a) majors in progress (b) minors in progress (c) joint degrees in progress (d) majors completed (e) minors completed (f) joint degrees completed
	1.4 SPECIAL TRAINING PROGRAMS	1.4.1 FELLOWSHIP PROGRAMS	(a) programs (b) participants
		1.4.2 INTERNATIONAL TRAINING	(a) participants
		1.4.3 WORKSHOPS & INSTITUTES	(a) programs (b) participants
		1.4.4 SERVICE COURSE PROGRAMS	(a) courses (b) enrollments
	1.5 COURSES	1.5.1 LABORATORY COURSES	(a) student contact hours (b) student materials productions (c) student publications, papers, etc.
		1.5.2 LECTURE/DISCUSSION COURSES	(a) student contact hours (b) student publications, etc.
		1.5.3 SEMINAR COURSES	(a) student contact hours (b) student publications, etc.
		1.5.4 INDEPENDENT STUDY	(a) student credit hours (b) student research studies (c) student publications, etc.
		1.5.5 INTERNSHIP EXPERIENCES	(a) student contact hours (b) package units (c) research studies (d) publications, etc.
	1.6 PROFESSIONAL ACTIVITIES	1.6.1 ACADEMIC COMMITTEES	(a) number of committees (b) meeting hours (c) reports issued, etc.
		1.6.2 PROPOSAL PREPARATION	(a) fellowship proposals submitted (b) research proposals submitted (c) fellowship proposals funded (d) research proposals funded
		1.6.3 ACADEMIC RESEARCH	(a) studies in progress (b) studies completed
		1.6.4 PROFESSIONAL WRITING	(a) articles written (b) monographs written (c) books written (d) articles published (e) monographs published (f) books published (g) editorships held
		1.6.5 STATE & NATIONAL SERVICE	(a) addresses, papers delivered (b) state organization memberships (c) national organization memberships (d) state organization offices (e) national organization offices (f) consultations
	1.7 CURRICULUM RESOURCES CENTER		(a) items processed (b) requests handled
	1.8 GENERAL ADMINISTRATION	supervision and coordination which cannot be directly charged to any specific out-put activity and must therefore be pro-rated against all other categories	

(figure two, continued)

PROGRAM	ACTIVITIES	SUB-ACTIVITIES	OUT-PUT INDICATORS
CAMPUS SERVICE ACTIVITIES / MATERIALS SERVICES	2.1 INSTRUCTIONAL DEVELOPMENT	2.1.1 DEVELOPMENT	(a) projects proposed (b) projects approved (c) projects completed (d) hours of instruction developed (e) student contact hours
		2.1.2 CONSULTATION	(a) instances (b) contact hours
		2.1.3 DEPARTMENTAL ADMINISTRATION	cost pro-rated to specific Instructional Development projects
	2.2 SELECTION	2.2.1 ON-CAMPUS CONSULTATION	(a) instances (c) contact hours
		2.2.2 IDENTIFICATION & EVALUATION (for IU Departments)	(a) titles identified (b) titles previewed (c) titles recommended
		2.2.3 CONFERENCES & FESTIVALS	(a) events assisted or conducted (b) titles shown
	2.3 CIRCULATION (Bloomington and regional campus uses only)	2.3.1 CODING	(a) orders coded (b) items coded
		2.3.2 BOOKING	(a) orders booked (b) items booked
		2.3.3 CONFIRMATION	(a) orders confirmed (b) items confirmed (c) confirmations typed
		2.3.4 ON-CAMPUS CONSULTATION	(a) instances (b) contact hours
	2.4 SHIPPING & INSPECTION (Bloomington and regional campus uses only)	2.4.1 SHIPPING	(a) titles shipped (b) reels shipped
		2.4.2 INSPECTION	(a) titles inspected (b) reels inspected
	2.5 CENTRAL CAMPUS SERVICE	2.5.1 EQUIPMENT POOL	(a) requests received (b) items scheduled (c) class hours served
		2.5.2 PROJECTIONIST SERVICE	(a) request received (b) instances scheduled (c) class hours served
		2.5.3 CONSULTATION	(a) instances (b) contact hours
		2.5.4 DEPARTMENTAL ADMINISTRATION	cost pro-rated to other Central Campus Service activities
PRODUCTION SERVICES	2.6 CAMPUS SERVICE SUB-CENTERS	2.6.1 CONSULTATION	(a) instances (b) contact hours
		2.6.2 DESIGN & LAY-OUT	(a) jobs (b) items
		2.6.3 PHOTOGRAPHY (COPY WORK)	(a) jobs (b) finished items
		2.6.4 TRANSPARENCY PRODUCTION	(a) jobs (b) finished items
		2.6.5 OPAQUE MATERIALS PRODUCTION	(a) jobs (b) finished items
		2.6.6 SUB-CENTER ADMINISTRATION	cost pro-rated to other Sub-Center activities
	2.7 GRAPHICS	2.7.1 CONSULTATION	(a) instances (b) contact hours
		2.7.2 DESIGN & LAY-OUT	(a) jobs (b) items (c) chargeable hours
		2.7.3 ILLUSTRATION	(a) jobs (b) items (c) chargeable hours
		2.7.4 MOUNTING	(a) jobs (b) items (c) chargeable hours
		2.7.5 LETTERING	(a) jobs (b) items (c) chargeable hours
		2.7.6 REPRODUCTION	(a) jobs (b) items (c) chargeable hours
		2.7.7 MISCELLANEOUS PROCESS STEPS	(a) jobs (b) items (c) chargeable hours
		2.7.8 DEPARTMENTAL ADMINISTRATION	cost pro-rated to other Graphics Department activities

(figure two, continued)

PROGRAM	ACTIVITIES	SUB-ACTIVITIES	OUT-PUT INDICATORS
CAMPUS SERVICE ACTIVITIES (CONTINUED) / PRODUCTION SERVICES (CONTINUED)	2.8 PHOTOGRAPHY	2.8.1 CONSULTATION	(a) instances (b) contact hours
		2.8.2 SHOOTING (Standard Copy)	(a) jobs (b) film units (rolls, sheets) (c) chargeable hours
		2.8.3 SHOOTING (Outsized Copy)	(a) jobs (b) film units (rolls, sheets) (c) chargeable hours
		2.8.4 SHOOTING (Portrait)	(a) jobs (b) film units (rolls, sheets) (c) chargeable hours
		2.8.5 SHOOTING (Location)	(a) jobs (b) film units (rolls, sheets) (c) chargeable hours
		2.8.6 SHOOTING (Scientific)	(a) jobs (b) film units (rolls, sheets) (c) chargeable hours
		2.8.7 PHOTO ARCHIVE	(a) items added (b) requests received (c) requests filled
		2.8.8 DEVELOPING	(a) jobs (b) film units (rolls, sheets) (c) chargeable hours
		2.8.9 PRINTING	(a) jobs (b) items (c) chargeable hours
		2.8.10 MOUNTING	(a) jobs (b) items (c) chargeable hours
		2.8.11 DEPARTMENTAL ADMINISTRATION	cost pro-rated to other Photo Lab activities
	2.9 MOTION PICTURE PRODUCTION	2.9.1 ON-CAMPUS CLIENT PRODUCTIONS (CP Productions)	(a) titles approved (in progress) (b) titles completed
		2.9.2 ON-CAMPUS CONSULTATION	(a) instances (b) contact hours
		2.9.3 CP PLANNING	(a) treatments prepared (b) scripts written (c) storyboards prepared
		2.9.4 CP SHOOTING	(a) location footage (b) studio footage (c) animation footage
		2.9.5 CP INITIAL EDIT	(a) rough edit footage (b) fine cut footage
		2.9.6 CP SOUNDING	(a) narration footage (b) music and effects footage (c) final mix footage
		2.9.7 CP FINAL EDIT	(a) interlock negative footage (b) reels approved negative
	2.10 AUDIO	2.10.1 CONSULTATION	(a) instances (b) contact hours
		2.10.2 RECORDING (Studio)	(a) jobs (b) reels or disks (c) chargeable hours
		2.10.3 RECORDING (Location)	(a) jobs (b) reels or disks (c) chargeable hours
		2.10.4 EDITING AND/OR MIXING	(a) jobs (b) reels or disks (c) chargeable hours
		2.10.5 DUPLICATION	(a) jobs (b) reels or disks (c) chargeable hours
		2.10.6 ADMINISTRATION	cost pro-rated to other Audio Studio activities
	2.11 FACILITIES SERVICES	2.11.1 CONSULTATION	(a) instances (b) contact hours
		2.11.2 CONVERSION	(a) projects proposed (b) projects approved (c) projects completed
	2.12 A-V CENTER ADMINISTRATION	supervision and coordination which cannot be directly charged to any specific out-put activity and must therefore be pro-rated against all other categories	

(figure two, continued)

PROGRAM	ACTIVITIES	SUB-ACTIVITIES	OUT-PUT INDICATORS
REVOLVING FUND ACTIVITIES	INCOME CATEGORIES	DIRECT CHARGES	Graphics Photo Lab Motion Picture Production Audio
		INTER-DEPARTMENTAL BILLINGS	Graphics Photo Lab Motion Picture Production Audio
FILM LIBRARY	3.1 SELECTION	3.1.1 IDENTIFICATION & EVALUATION	(a) titles identified (b) titles previewed (c) titles selected for purchase
		3.1.2 INFORMATION SERVICES	(a) items added to files (b) producer reports issued (c) EFLA forms prepared (d) reviews published (e) catalogs & supplements issued (f) subject & age level listings (g) bibliographies, etc.
		3.1.3 LIBRARY MAINTENANCE	(a) titles accessioned (b) titles reevaluated (c) replacement footage ordered (d) user and usage reports
		3.1.4 OFF-CAMPUS CONSULTATION	(a) instances (b) contact hours
		3.1.5 DEPARTMENTAL ADMINISTRATION	cost pro-rated to other Selection Department activities
	3.2 CIRCULATION	3.2.1 CODING	(a) orders coded (b) items coded
		3.2.2 BOOKING	(a) orders booked (b) items booked
		3.2.3 CONFIRMATION	(a) orders confirmed (b) titles confirmed (c) confirmations typed
		3.2.4 OFF-CAMPUS CONSULTATION	(a) instances (b) contact hours
		3.2.5 DEPARTMENTAL ADMINISTRATION	cost pro-rated to other Circulation Department activities
	3.3 SHIPPING & INSPECTION	3.3.1 SHIPPING	(a) titles shipped (b) reels shipped
		3.3.2 INSPECTION	(a) titles inspected (b) reels inspected
		3.3.3 REPAIR & REJUVENATION	(a) repairs made (b) titles rejuvenated (c) reels rejuvenated
		3.3.4 DEPARTMENTAL ADMINISTRATION	costs pro-rated to othe Shipping and Inspection activities
	3.4 MOTION PICTURE PRODUCTION	3.4.1 EP PROJECTS	(a) titles approved (in progress) (b) titles completed
		3.4.2 CP PROJECTS	(a) titles approved (in progress) (b) titles completed
		3.4.3 OFF-CAMPUS CONSULTATION	(a) instances (b) contact hours
		3.4.4 FEASIBILITY STUDY	(a) EP proposals (b) CP proposals (c) approved EP projects (d) approved CP projects
		3.4.5 PLANNING	(a) treatments prepared (b) scripts written (c) story boards prepared
		3.4.6 SHOOTING	(a) location footage (b) studio footage (c) animation footage
		3.4.7 INITIAL EDIT	(a) rough edit footage (b) fine cut footage
		3.4.8 SOUNDING	(a) narration footage (b) music and effects footage (c) final mix footage
		3.4.9 FINAL EDIT	(a) interlock negative footage (b) reels approved negative
		3.4.10 DEPARTMENTAL ADMINISTRATION	cost pro-rated to other Production Department activities

(figure two, continued)

PROGRAM	ACTIVITIES	SUB-ACTIVITIES	OUT-PUT INDICATORS
REVOLVING FUND ACTIVITIES (CONTINUED)	3.5 FIELD SERVICES	3.5.1 PRODUCT EVALUATION AND DEVELOPMENT	(a) NET programs considered (b) ETS programs considered (c) NIT programs considered (d) NET programs accepted (e) ETS programs accepted (f) NIT programs accepted
		3.5.2 INFORMATION SERVICES	(a) items designed (b) IU titles promoted (c) NET titles promoted (d) ETS titles promoted (e) NIT titles promoted (f) exhibitions attended
		3.5.3 CUSTOMER RELATIONS	(a) requests received (b) requests filled
		3.5.4 OPERATIONS	(a) IU previews sent (b) NET previews sent (c) ETS previews sent (d) NIT previews sent (e) IU prints sold (f) NET prints sold (g) ETS prints sold (h) NIT prints sold
		3.5.5 BULK MAILING	(a) mailings (b) pieces mailed
		3.5.6 VIDEO TAPE DISTRIBUTION	(a) NIT tapes shipped (b) ETS tapes shipped
		3.5.7 DEPARTMENTAL ADMINISTRATION	cost pro-rated to other Field Service activities
	3.6 ACCOUNTS RECEIVABLE	3.6.1 CODING	(a) orders coded (b) items coded
		3.6.2 POSTING	(a) orders posted (b) items posted
	3.7 A-V CENTER ADMINISTRATION	supervision and coordination which cannot be directly charged to any specific out-put activity and must therefore be pro-rated against all other categories	
	INCOME CATEGORIES	FILM RENTALS	IU Titles NET Titles ETS Titles NIT Titles General Collection
		FILM SALES	IU Titles NET Titles ETS Titles NIT Titles
		VIDEO TAPE DISTRIBUTION	ETS NIT
		BULK MAILING	

Most activities of DIST/AVC can be identified as falling under a single program area and a single department. There are occasions, however, when a single activity will cut across several departments of AVC and contribute to the goals of all three program areas of DIST/AVC. A project under the Instructional Development Department, as an example, might call on the production services of the Graphics, Photographic, and Motion Picture Production Departments and require budget control from Administration while

serving as a practicum experience for a doctoral level course in DIST and producing a product both to improve campus instruction and to be distributed by Field Services on a revolving fund basis. In order to measure the effectiveness of all elements of DIST/AVC which are involved in such a project, it was necessary to design a new management control model[6] and to make provision for such projects in the measurement of out-puts. As a result, when out-puts are measured, a project such as the one described above will appear both as hours of instruction developed under the activity of Instructional Development and as product out-put for the various production departments involved in the project.

THIRD CONSTRAINT: SHOULD AID IN MAKING RESOURCE ALLOCATION DECISIONS

It is not how out-puts are defined but how they are used which determines their usefulness in assisting management decision making. However, the way in which they are defined can make possible or extremely difficult certain potential uses of the data which ultimately will be gathered. The units identified in this exercise are to be used to examine the realative cost of current DIST/AVC activities, to evaluate the effectiveness of these activities, to assist in the identification of alternative methods of achieving program goals, and to serve as a basis for comparing such alternatives with the current activities conducted by DIST/AVC.

6 The initial control system developed for DIST/AVC is described in: Wilkinson, Gene L., R&D Project Control System, internal paper, Audio-Visual Center, Indiana University, Bloomington, Indiana, May 1970, 22 pages.

In order to determine out-puts which would assist in these activities, it was necessary to not just establish out-puts for each organizational unit as a whole but also for each discrete function or process stage within the various units. The items listed in the sub-activity column of FIGURE TWO represent the discrete functions which were identified during the analysis. These were derived by flow charting the various operational areas of AVC. FIGURE THREE, on page 14, illustrates the simplified work-flow in one of the operational areas--the Photographic Laboratory. This example was chosen because it is a good illustration both of the potential usefulness of the out-put units and of the difficulty in defining over-all out-puts for a full department. The process stages which are shown on the flow chart are not drawn as a continuous process but rather as a random access system. This is because not all jobs which come in to the Photo Lab go through all of the process steps and because each of the steps can be evaluated separately from the others with separate decisions on resource allocation being made. For example, shall portrait work be continued or dropped, shall the photo archive be expanded or continued at the same level, or shall developing be contracted out to a commercial lab? Such a decision was made in the past when a commercial lab was given the contract to develop 16mm motion picture film for the Motion Picture Production Department.

It is relatively easy to see, on the basis of the above example, how out-put units might be used to make resource allocation decisions when looking at the allocation of resources within an area of the total program, such as the Photo Lab. The problem is much more difficult when the question is one of allocating resources between two different departments. Should the Photo

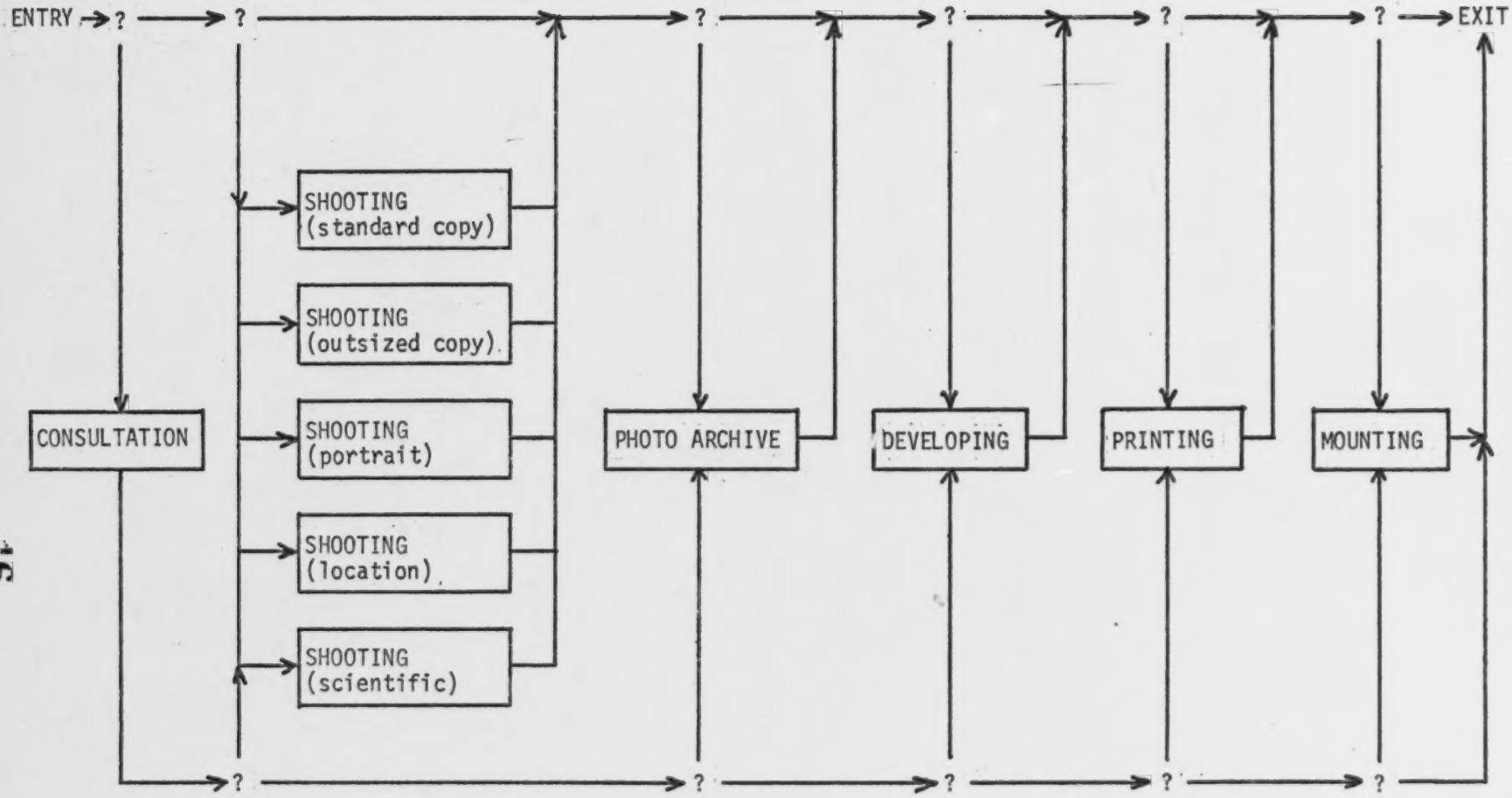

FIGURE THREE: Simplified Work-Flow Diagram of the Photographic Laboratory.

Lab receive more of the limited funds available to DIST/AVC or should it be cut back in order to provide more support to the Training Department? This type of decision requires, at the minimal level, an over-all unit for each of the competing divisions. Ideally this would be the same unit for all divisions. This is the reason that in many reported studies the final report is listed in such units as student-contact-hours or dollar value of product. The problem with these solutions is that, while such support services as closed circuit television or even, with strong reservations, motion picture production might be able to compute a student-contact-hour figure for their activities, it is impossible to determine such a value for a still photograph and the economic value of a support service would not be just the market price of equivalent services from private contractors but also a determined value for the convenience of having the service constantly available to the institution or to have available certain services which are not commercially available.

The problem of defining over-all divisional out-put units does not become appreciably easier when the decision is made not to attempt to come up with a common unit for all divisions. The function of the Photo Lab is to produce photographs. But, not all photographs are the same. Should a 35mm slide of a live microscopic specimen be equated with a student ID photo? Is an 8 by 10 glossy of an archive negative equal to an 8 by 10 glossy of current construction which required the photographer to climb 6 flights of open steel work? FIGURE FOUR (page 16) illustrates one attempt to solve this problem for the Photo Lab. By establishing a matrix of Photo Lab functions it was possible to identify five basic classes

PHOTO LAB CONTINUING FUNCTIONS					
Consultation	Shooting	Developing	Printing	Mounting	PRODUCT CLASS
x	-	-	-	-	1 - 1 step
-	x	-	-	-	2
-	-	x	-	-	3
-	-	-	x	-	4
-	-	-	-	x	5
x	x	-	-	-	1 - 2 step
x	-	x	-	-	2
x	-	-	x	-	3
x	-	-	-	x	4
-	x	x	-	-	5
-	x	-	x	-	6
-	x	-	-	x	7
-	-	x	x	-	8
-	-	x	-	x	9
-	-	-	x	x	10
x	x	x	-	-	1 - 3 step
x	x	-	x	-	2
x	x	-	-	x	3
x	-	x	x	-	4
x	-	x	-	x	5
x	-	-	x	x	6
-	x	x	x	-	7
-	x	x	-	x	8
-	x	-	x	x	9
-	-	x	x	x	10
x	x	x	x	-	1 - 4 step
x	x	x	-	x	2
x	x	-	x	x	3
x	-	x	x	x	4
-	x	x	x	x	5
x	x	x	x	x	1 - 5 step

FIGURE FOUR: Derivation of Photo Lab Basic Product Classes and Variations.

of Photo Lab products with 31 basic variations across the five classes. With the further variation caused by five different variations in shooting and the possibility of printing and/or mounting items directly from the

archive, the total number of variations across product classes increased to 111, without even considering variations caused by different film types or printing formats. After a point, finer and finer analysis looses its value. For this reason no attempt was made to define an over-all out-put for photographic services in FIGURE TWO. The process units defined are adequate for the types of decisions which must be made in relation to the internal functioning of the Photo Lab, and what is essentially a value decision as to the value of the Photo Lab is left openly as a value decision rather than attempting to hide the decision under a cloud of "scientific" information.